written because the Rev. Professor had written a very long one, in which he applied this kind of bad reasoning in relation to a bit of a leafy part of a tree found at Bournemouth in an Eocene deposit. The leaves of his bit resemble those of *Araucaria Cunninghami* squashed; nevertheless a thermometric virtue is given to the fossil because this Araucaria is native in districts in Eastern Australia.

Self-satisfied with his recognition of the similarity of the leaves, the Rev. Professor coolly assumes that he has made out his species, and therefore demands the name of mine, giving me a scolding before I could possibly let him have it.

It is curious that the Rev. Professor should not have seen the point of my letter, and the only explanation is that he was so taken up with the incomparable value of his delicate "self-registering plant thermometer." I did not believe in his discovery, and my bamboo—never mind whence it came—was quite as good in the method of argument as his so-called Araucaria. No botanist would feel satisfied with the coneless evidence of the Rev. Professor, and his genus is in doubt as well as his species. With regard to this, Lindley stated years since that *Araucaria Cunninghami* is a "supposed species" in relation to the Norfolk Island *C. excelsa*. So the "self-registering thermometer" has neither bulb nor stem, and the spirit or the mercury represents the Rev. Professor's genius. He bids me plant the bamboo in the sunny south-west. Not so; it is the damp soil and the shade which have permitted the stems to grow up to 10 feet 6 inches. He tells me that the bamboo grows in China: that fact I had heard of before, and it has been strikingly impressed on many generations of Celestials. Last week, but too late for my purpose of immediate publication in NATURE, I learned that the bamboo is of the sub-genus *Arundinacea*, and the species is *falcata*. Its natural habitat is in the temperate Himalayas, where frosts, fogs, and north-east winds, such as plague the Thames Valley, are unknown.

Finally I believe that the so-called *A. Cunninghami* has grown of late years in the south of England.

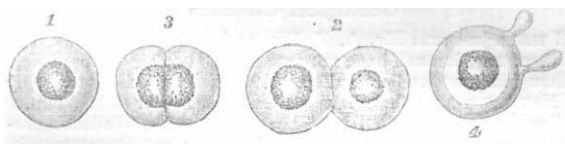
December 9 P. MARTIN DUNCAN

## Hailstorm in Dorsetshire

AT about 1.30 on the 25th of last November, with a strong wind from the south-west, this place was visited by a hailstorm which lasted about five minutes, accompanied by rain and violent gusts of wind, and by a single vivid flash of lightning which was followed with scarcely more than an appreciable interval by the thunder.

The character of the hailstones which fell on the occasion, and which I examined before they could have undergone any important change induced by the higher temperature of the surrounding air, may be worth noting; for though they were not of very unusual size, and in most respects scarcely departed from what may be regarded as the typical condition of hailstones, they exhibited some features not generally met with in so well-marked a form.

In their simplest condition their shape was that of a sphere, and in every such case they consisted of a spherical nucleus of




opaque white ice enveloped by a concentric shell of ice perfectly transparent and homogeneous, showing none of the radial striæ often met with in hailstones (Fig. 1). The largest measured about half an inch in diameter, the nucleus having a diameter of about a quarter of an inch. The appearance of the opaque white nucleus surrounded by its thick crystal-clear envelope was very striking and beautiful.

In many cases two such hailstones were united firmly to one another, doubtless by a process of regelation after contact. In some of these the transparent envelope was continuous around each of the nuclei in the plane of contact (Fig. 2). In others it was here deficient, and the two nuclei were then in immediate contact with one another (Fig. 3). The difference thus presented is not without significance as affording evidence that there are two distinct conditions under which the union of hailstones by regelation may occur; for it is probable that in the former case the contact and regelation had taken place directly between the nuclei while as yet free from the investing shell of clear ice which had afterwards formed around the twin nuclei; while in the latter case the envelope had already existed before the contact and regelation of the hailstones.

Another frequent occurrence was the presence of one or two little piriform offsets, which projected from the surface of the hailstone, and were, like the envelope itself, formed of clear homogeneous ice (Fig. 4). In a paper published in the *Proc.* Asiatic Society for June, 1880, to which my attention has been called by Mr. Scott of the Meteorological Office, very similar club-shaped projections of transparent ice are described by Mr. Blanford in large hailstones figured by Col. Godwin-Austen as having fallen at Calcutta in March, 1877.

It is possible that in these cases the projections had originally the form of crystals, and that their faces and angles had been rounded off in passing through a warmer region of the atmosphere, such radiating crystals of ice not being unknown. In a memoir by Abich ("Ueber Kugel Hagel im Unterem Kaukasus," Vienna, 1879), for a knowledge of which I am also indebted to Mr. Scott, an account is given of certain very large hailstones which fell at Tiflis in Georgia, and had large ice crystals radiating from the surface. GEO. J. ALLMAN

Ardmore, Parkstone, Dorset, December 11

## Sargassum

I FIND in NATURE, vol. xxiii. p. 70, a short report on my paper, "Revision von Sargassum," with several objections, which I believe to be erroneous. It is said that the fragments occurring sometimes on the open sea, the so-called *Sargassum bacciferum*, should have a bright yellow colour. Not long ago I received fresh samples thereof from the Sargasso Sea, which are not yellow at all; these fragments are never bright yellow, but of the same brown, varying to yellowish colour as decaying *Fucus vesiculosus*. I observed the latter, for instance, in this condition in several fjörds of Norway, where I found broken Fucus in greater quantities than ever I did Sargassum in the open sea between England and the West Indies.

*Macrocystis pyrifera* shows always stem and leaves entangled in a ball, if broken and swimming in the open sea (*vide* p. 235 of my treatise), and the Sargasso fragments of the open sea are also often entangled in compact balls, as Sir Wyville Thomson states ("The Atlantic," i. 194), and as it may be seen on my phototypic table, Fig. 1.

If the floating Sargassum should have no reproductive organs, this would be no difficulty, but rather a confirmation of my views on the fragmentary nature of swimming Sargassum, for a particular pelagic species could not be without reproductive organs. Besides there have been found "with certainty" sometimes samples in the open sea with reproductive organs, and I gave an explanation of their seldom occurrence by want or breaking off of the air-vesicles. The writer on my paper is mistaken in comparing Macrocystis and Fucus with Sargassum, for the air-vesicles and reproductive organs of Sargassum are separate from the leaves and isolated on thin stalks, which break off easily, while those of Fucus and Macrocystis are never separate, but in the middle of the leaf or on the base, or on the broad end of the leaf or thallus. Therefore swimming Sargassum is found often without reproductive organs, and its air-vesicles are often broken off, whilst on Macrocystis and Fucus such a separation is not possible. Having refuted those objections, and having also brought in my paper many more arguments against the existence and vegetation of *Sargassum bacciferum* than there are mentioned in the short report, I hope that my results on Sargassum will now generally be accepted.

Leipzig-Eutritzsch, December 4 OTTO KUNTZE

## Note on an Acoustical Constant

THE number of vibrations executed in a second by a stretched string is generally represented in the text-books by a formula expressing the method of its variation with the determining circumstances, such as—

$$n \propto \frac{1}{d\,l}\sqrt{\frac{T}{s}},$$

where $d$ is the diameter, $l$ the length, $s$ the specific gravity of the string, and $T$ the tension or stretching force, but the absolute number of vibrations is not generally given by the formula.

Now if we write instead of the above—

$$n = \frac{k}{d\,l}\sqrt{\frac{T}{s}},$$

where $k$ is some constant, it is evident that $k$ will not depend on the nature of the string but solely on the system of units employed to express $d$, $l$, and $T$.

If C.G.S. units be employed, we have, as stated in Prof. Everett's translation of Deschanel—

$$n = \frac{1}{2\,l}\sqrt{\frac{T}{m}},$$

where $m$ is the mass of unit length; and as we may write instead of $m$, $\pi r^2 s$, $r$ being the radius of the wire, we shall have—

$$n = \frac{1}{\sqrt{\pi}}\cdot\frac{1}{2\,r\,l}\cdot\sqrt{\frac{T}{s}}, \text{ or } \frac{1}{\sqrt{\pi}}\cdot\frac{1}{d\,l}\cdot\sqrt{\frac{T}{s}},$$

so that here $k = \frac{1}{\sqrt{\pi}} = \cdot5642$ approximately.

With any other system of units we may of course determine $k$ from the value just given, by multiplying or dividing by the ratios of the new to the C.G.S. units; for example, if $d$ be expressed in millimetres, $l$ in metres, and $T$ in kilogrammes, our new constant would be—

$$k = \frac{1}{\sqrt{\pi}}\cdot\frac{10}{1}\cdot\frac{1}{100}\cdot\sqrt{981000}$$

$$= \frac{99\cdot04}{\sqrt{\pi}} = 55\cdot87.$$

But we may also determine $k$ directly for any system of units in the following manner:—If, in the formula—

$$n = \frac{k}{d\,l}\sqrt{\frac{T}{s}},$$

we make $d$, $l$, $T$, $s$, each unity, we shall have—

$$n = k.$$

Imagine then a wire of water, 1 mm. diam., 1 metre long, stretched by a weight of 1 kilo.: its weight would be ·7854 grm., and $H$, the "tension length," or length which would be equal in weight to the stretching weight, would be $\frac{1000}{\cdot7854}$ = 1273·2 metres. The velocity $v$ of transmission of a pulse along the wire would be $\sqrt{gH} = \sqrt{9\cdot81 \times 1273\cdot2} = 111\cdot76$ metres per second, and the number of vibrations per second—

$$n = \frac{v}{2\,l} = \frac{111\cdot76}{2} = 55\cdot88 = k,$$

the same figure as that obtained above.

If the units in which $d$, $l$, and $T$ are expressed are respectively the tenth of an inch, the foot, and the pound, $k$ becomes 48·66.

In the later editions of Ganot's "Physics" we find the formula—

$$n = 9\cdot8257\sqrt{\frac{c}{l}}$$

given, where $c$ is the "tension length," and $l$ the length of the string, both expressed in inches. This formula would of course be of more easy application than those given above when we know the weight per foot of the string, but does not directly show the relation of $n$ to the diameter and specific gravity.

W. J. GREY
Newcastle-on-Tyne J. T. DUNN

### The U.S. Weather Charts

I SHOULD be much obliged if you would inform me whether the United States Monthly Charts of Meteorological Data, in continuation of the series published in NATURE, can be procured in London, and if so where. H. M.

6, Charles Street, Grosvenor Square, December 7

### Climate of Vancouver Island

MR. ALFRED R. WALLACE asserts in his letter published in NATURE, vol. xxiii. p. 124, that the climate of Vancouver Island is not so mild as that of London.

For three years I commanded a gunboat on those shores; speaking from recollection, and not from recorded observations, and with great deference to so distinguished a naturalist as Mr. Wallace, I should have said that the climate of Vancouver Island was a good deal milder than that of London.

EDMUND H. VERNEY

Travellers' Club, Pall Mall, S.W., December 11

### Meteors

ON the evening of November 20 at about 8 p.m. my attention was attracted by a number of meteors appearing as often as once per minute in different quarters of the heavens, but pursuing courses apparently radiating from a point near the constellation Andromeda. M. A. VEEDER

Lyons, New York, November 22

## THE PROBABILITY OF PHYLLOXERA CROSSING THE TROPICS

MUCH alarm has been felt by the wine-growers of South Africa at the possibility of the phylloxera being introduced into the Cape vineyards. Very stringent regulations have been framed in consequence, prohibiting the importation of living plants or vegetables in any form; and so rigidly have these regulations been carried out that it is stated that, in accordance with them, a cargo of potatoes from New Zealand was destroyed on its reaching Capetown.

It is generally conceded by the experts who have been consulted that the importation of vines, on the tissues of which the phylloxera would be able to live in transit, must be prohibited. The phylloxera can however, it is admitted, feed on no other plant but the vine, and the important question for the South African Government to decide is whether it is really needful to exclude other plants or vegetables besides the vine. In order to obtain the best opinion upon this point, Dr. Maxime Cornu was consulted. He accordingly drew up several reports, in which he expresses the opinion that, though extremely unlikely, it is still theoretically possible that the phylloxera should be conveyed from Europe to South Africa by means of other vegetable products than the vine, and he therefore supports the prohibitive action taken by the Cape Government.

The inconvenience to the community which such a policy involves is necessarily considerable. The grounds of Dr. Maxime Cornu's decision have therefore been carefully considered by an entomologist who has studied the subject and who has drawn up the following notes The question is of great importance to all wine-growing countries in the southern hemisphere, and as these doubtless contain many readers of NATURE, I think the publication of these notes in its columns will give them the best opportunity of being fairly considered.

W. T. T. D.

*Notes on Dr. Cornu's Reports on the Phylloxera, and on the Protective Measures against its Introduction.*

Among the "truths" laid down in the first report, No. I. is, "The *Phylloxera vastatrix* lives only upon the vine." This is emphasised in the third report ("Memorandum on Laws of Protection, &c."), Paragraph No. IV., stating, "they (the insects) can, moreover, subsist only upon the vine."

Notwithstanding these unreserved statements of this fundamental fact in the life history of phylloxera, the same "Memorandum on Laws of Protection, &c.," proceeds (in its "General Conclusion") to recommend, "if such a course were possible," the imitation of "the example set by Algeria, and to forbid the introduction of all vegetable products whatever, with the exception of those which are absolutely required for consumption."

It may well be asked on what ground such a recommendation is based. After stating (Third Report, Paragraph IV.) that the phylloxera cannot live when dissociated from the vine for more than four or five days, and requires protection from dessication in any case, Dr.